

# AMENDMENT

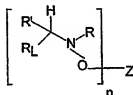
## IN THE CLAIMS:

Please amend the claims as follows:

1-11. (Canceled)

12. (Previously presented) A process for the preparation of a transparent and impact-resistant polymer material comprising a brittle matrix (I) having a glass transition temperature of greater than 0°C in which is dispersed a block copolymer (II) of formula B-(A)<sub>n</sub>, n being between 2 and 20, with a polydispersity of between 1.5 and 3, B being a polymer block with a glass transition temperature of less than 0°C and with a polydispersity index of less than 2 and A being a polymer block with a glass transition temperature of greater than 0°C, A being compatible with the matrix, wherein the block copolymer (II) is obtained by controlled radical polymerization in the presence of a nitroxide, comprising

(1) preparing the first block B by mixing the monomer(s) with an alkoxyamine of formula:



- where R' and R, which are identical or different, optionally connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms optionally substituted by hydroxyl, alkoxy or amino groups;
  - where R<sub>L</sub> is a monovalent group with a molar mass of greater than 16 g/mol; and
  - where Z is a polyvalent radical carrying end functional groups of styrol or acryloyl, adding a nitroxide, and carrying out the polymerization at temperatures ranging from 60 to 250°C, pressures ranging from 0.100 bar to 80 bar,
- (2) diluting the first block B obtained in the mixture of monomers intended to form the block A compatible to the brittle matrix which is desired to see reinforced against impact,

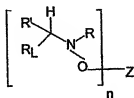
adding between 0 and 100 molar equivalents of a radical polymerization initiator, carrying out the polymerization at temperatures ranging from 60 to 250°C, and pressures ranging from 0.100 bar to 80 bar, the conversion of the monomer being from 10 to 100%, and separating the polymer obtained from the residual monomers by evaporation under vacuum at temperatures ranging up to 250°C,

(3) mixing the product obtained in step (2) with the brittle matrix which it is desired to see reinforced against impact, optionally in the presence of other additives, and

wherein the relative lengths of the first block B and the block A are selected such that  $n \cdot \text{Mn(A)} / (n \cdot \text{Mn(A)} + \text{Mn(B)})$  is between 0.5 and 0.95, wherein, Mn(A) is the number-average molecular mass of the block A, Mn(B) is the number-average molecular mass of the first block B, and n is the number of polymer blocks A in the block copolymer obtained in step (2).

13. (Currently amended) A process for the preparation of a transparent and impact-resistant polymer material comprising a brittle matrix (I) having a glass transition temperature of greater than 0°C in which is dispersed a block copolymer (II) of formula B-(A)<sub>n</sub>, n being between 2 and 20, with a polydispersity of between 1.5 and 3, B being a polymer block with a glass transition temperature of less than 0°C and with a polydispersity index of less than 2 and A being a polymer block with a glass transition temperature of greater than 0°C, A being compatible with the matrix, wherein the block copolymer (II) is obtained by controlled radical polymerization in the presence of a nitroxide, comprising

(1) preparing the first block B by mixing the monomer(s) with an alkoxyamine of formula:



- where R' and R, which are identical or different, optionally connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms optionally substituted by hydroxyl, alkoxy or amino groups;

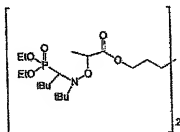
- where  $R_L$  is a monovalent group with a ~~number-average~~ molar mass of greater than 16 g/mol;  
and

- where Z is a polyvalent radical carrying end functional groups of styrol or acryloyl,  
adding a nitroxide, and  
carrying out the polymerization at temperatures ranging from 60 to 250°C, pressures  
ranging from 0.100 bar to 80 bar,

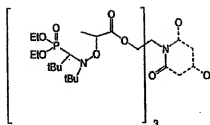
(2) diluting the first block B obtained in the mixture of monomers intended to form the  
block A compatible to the brittle matrix which is desired to see reinforced against impact,  
adding between 0 and 100 molar equivalents of a radical polymerization initiator,  
carrying out the polymerization at temperatures ranging from 60 to 250°C, and pressures  
ranging from 0.100 bar to 80 bar, the conversion of the monomer being from 10 to 100%, and  
separating the polymer obtained from the residual monomers by evaporation under  
vacuum at temperatures ranging up to 250°C,

(3) diluting the product obtained step (2) in a mixture of monomers selected from the  
group consisting of styrene, MMA, epoxides, mixtures of diols and of diacid, or precursors of  
polyamides to obtain a diluted product and then polymerizing the diluted product; and  
wherein A represents from 50% to 95% by weight of the total weight of the block  
copolymer (II) and the number-average molar mass of A is between 10,000 to  $10^6$  g/mol.

14. (Previously presented) The process as claimed in claim 35, wherein the alkoxyamine used  
corresponds to the following formula:



15. (Previously presented) The process as claimed in claim 35, wherein the alkoxyamine used  
corresponds to the formula:



16. (Previously presented) The process as claimed in claim 35, wherein the polydispersity is between 2 and 2.5.

17. (Previously presented) The process as claimed in claim 34, wherein the number-average molar mass of block B is greater than 20,000 g/mol.

18. (Previously presented) The process as claimed in claim 34, wherein the number-average molar mass of block B is greater than 60,000 g/mol.

19. (Canceled)

20. (Previously presented) The process as claimed in claim 35, wherein the polymerization temperature in step (1) is from 90 to 160°C and the pressure is from 0.5 bar to 10 bar, the polymerization temperature in step (2) is from 90 to 160°C and the pressure is from 0.5 bar to 10 bar, and the evaporation temperature is 200°C.

21–23. (Canceled)

24. (Previously presented) The process as claimed in claim 35, wherein R and R' are tert-butyl groups.

25. (Previously presented) The process as claimed in claim 35, wherein R<sub>L</sub> is a phosphorus group

or a phosphonate group of formula:



- where R'' and R''', which are identical or different, optionally connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms optionally substituted by hydroxyl, alkoxy or amino groups.

26. (Previously presented) The process as claimed in claim 35, wherein the brittle matrix is selected from the group consisting of PMMA, polyesters of PET or PBT, polystyrene, PVDF, polyamides, polycarbonates and PVC.

27. (Previously presented) The process as claimed in claim 35, wherein the additives include a second impact modifier.

28. (Previously presented) The process according to claim 27, wherein the impact modifier is an acrylic impact modifier.

29. (Canceled)

30. (Previously presented) The process of claim 25, wherein R'' and R''' are ethyl groups.

31. (Previously presented) The process as claimed in claim 35, wherein the block copolymer has a polydispersity of between 1.8 and 2.7.

32. (Previously presented) The process as claimed in claim 35, wherein the proportion of brittle matrix is between 10 and 85%.

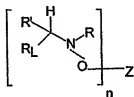
33. (Previously presented) The process as claimed in claim 35, wherein the brittle matrix is

greater than 50% by weight of at least one polymer selected from the group consisting of poly(methyl methacrylate), polystyrene, poly(vinylidene fluoride), polyesters, polycarbonate, poly(vinyl chloride), polyamide, polyepoxides, polyethylene, polyacrylonitrile and their copolymers.

34. (Previously presented) The process as claimed in claim 35, wherein the block B exhibits a number-average molar mass of greater than 5000 g/mol.

35. (Previously presented) A process for the preparation of a transparent and impact-resistant polymer material comprising a brittle matrix (I) having a glass transition temperature of greater than 0°C in which is dispersed a block copolymer (II) of formula B-(A)<sub>n</sub>, n being between 2 and 20, with a polydispersity of between 1.5 and 3, B being a polymer block with a glass transition temperature of less than 0°C and with a polydispersity index of less than 2 and A being a polymer block with a glass transition temperature of greater than 0°C, A being compatible with the matrix, wherein the block copolymer (II) is obtained by controlled radical polymerization in the presence of a nitroxide, comprising

(1) preparing the first block B by mixing the monomer(s) with an alkoxyamine of formula:



- where R' and R, which are identical or different, optionally connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms optionally substituted by hydroxyl, alkoxy or amino groups;
- where R<sub>L</sub> is a monovalent group with a molar mass of greater than 16 g/mol; and
- where Z is a polyvalent radical carrying end functional groups of styrol or acryloyl, adding a nitroxide, and carrying out the polymerization at temperatures ranging from 60 to 250°C, pressures

ranging from 0.100 bar to 80 bar,

(2) diluting the first block B obtained in the mixture of monomers intended to form the block A compatible to the brittle matrix which is desired to see reinforced against impact, adding between 0 and 100 molar equivalents of a radical polymerization initiator, carrying out the polymerization at temperatures ranging from 60 to 250°C, and pressures ranging from 0.100 bar to 80 bar, the conversion of the monomer being from 10 to 100%, and separating the polymer obtained from the residual monomers by evaporation under vacuum at temperatures ranging up to 250°C,

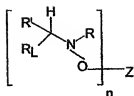
(3) mixing the product obtained in step (2) with the brittle matrix which it is desired to see reinforced against impact, optionally in the presence of other additives; and wherein A represents from 50% to 95% by weight of the total weight of the block copolymer (II) and the number-average molar mass of A is between 10,000 to  $10^6$  g/mol.

36. (Previously presented) The method according to claim 12, wherein mixing the product is by extruding the product obtained in step (2) with the brittle matrix.

37. (Previously presented) The method according to claim 35, wherein mixing the product is by extruding the product obtained in step (2) with the brittle matrix.

38. (Previously presented) A process for the preparation of a transparent and impact-resistant polymer material comprising a brittle matrix (I) having a glass transition temperature of greater than 0°C in which is dispersed a block copolymer (II) of formula B-(A)<sub>n</sub>, n being between 2 and 20, with a polydispersity of between 1.5 and 3, B being a polymer block with a glass transition temperature of less than 0°C and with a polydispersity index of less than 2 and A being a polymer block with a glass transition temperature of greater than 0°C, A being compatible with the matrix, wherein the block copolymer (II) is obtained by controlled radical polymerization in the presence of a nitroxide, comprising

(1) preparing the first block B by mixing the monomer(s) with an alkoxyamine of formula:



- where R' and R, which are identical or different, optionally connected so as to form a ring, are alkyl groups having between 1 and 40 carbon atoms optionally substituted by hydroxyl, alkoxy or amino groups;

- where R<sub>L</sub> is a monovalent group with a molar mass of greater than 16 g/mol; and

- where Z is a polyvalent radical carrying end functional groups of styryl or acryloyl, adding a nitroxide, and

carrying out the polymerization at temperatures ranging from 60 to 250°C, pressures ranging from 0.100 bar to 80 bar,

(2) diluting the first block B obtained in the mixture of monomers intended to form the block A compatible to the brittle matrix which is desired to see reinforced against impact, adding between 0 and 100 molar equivalents of a radical polymerization initiator, carrying out the polymerization at temperatures ranging from 60 to 250°C, and pressures ranging from 0.100 bar to 80 bar, the conversion of the monomer being from 10 to 100%, and separating the polymer obtained from the residual monomers by evaporation under vacuum at temperatures ranging up to 250°C,

(3) diluting the product obtained step (2) in a mixture of monomers selected from the group consisting of styrene, MMA, epoxides, mixtures of diols and of diacid, or precursors of polyamides to obtain a diluted product and then polymerizing the diluted product, and

wherein the relative lengths of the first block B and the block A are selected such that  $n \cdot \text{Mn(A)} / (n \cdot \text{Mn(A)} + \text{Mn(B)})$  is between 0.5 and 0.95, wherein, Mn(A) is the number-average molecular mass of the block A, Mn(B) is the number-average molecular mass of the first block B, and n is the number of polymer blocks A in the block copolymer obtained in step (2).